Refine Search

Search Results -

Term	Documents
ALLOCAT$	0
ALLOCAT	120
ALLOCATABILITY	10
ALLOCATABLE	1454
ALLOCATABLEBYTES	1
ALLOCATABLEE	1
ALLOCATABLEPERSISTENTBYTES	1
ALLOCATABLE-ADDRESSABLE	1
ALLOCATABLE-AREA	1
ALLOCATABLE-OPT	1
ALLOCATABLE/UNALLOCATABLE	1
(L5 AND ALLOCAT$).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	16

There are more results than shown above. Click here to view the entire set.

Database:

US Pre-Grant Publication Full-Text Database
US Patents Full-Text Database
US OCR Full-Text Database
EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Search: L6

Refine Search

Recall Text ⬍   Clear   Interrupt

Search History

DATE: Saturday, December 10, 2005   Printable Copy   Create Case

Set Name side by side	Query	Hit Count	Set Name result set

DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR

L6	L5 and allocat$	16	L6
L5	L4 and (volume near block)	21	L5
L4	L3 and (file near system)	114	L4
L3	L2 and "read-only"	158	L3
L2	snapshot near copy	478	L2
L1	snashop near copy	0	L1

END OF SEARCH HISTORY

Hit List

| Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs |

| Generate OACS |

Search Results - Record(s) 1 through 16 of 16 returned.

☐ 1. Document ID: US 20050273570 A1

Using default format because multiple data bases are involved.

L6: Entry 1 of 16   File: PGPB   Dec 8, 2005

```
PGPUB-DOCUMENT-NUMBER: 20050273570
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050273570 A1
```

TITLE: Virtual space manager for computer having a physical address extension feature

PUBLICATION-DATE: December 8, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
DeSouter, Marc A.	Wayne	NJ	US
Armangau, Philippe	Acton	MA	US
Ahmed, Ishraq Mohammed	Cary	NC	US
Glidewell, Keith	Chapel Hill	NC	US

US-CL-CURRENT: 711/203; 711/170, 711/207

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D‹ |

☐ 2. Document ID: US 20050216788 A1

L6: Entry 2 of 16   File: PGPB   Sep 29, 2005

```
PGPUB-DOCUMENT-NUMBER: 20050216788
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050216788 A1
```

TITLE: Fast backup storage and fast recovery of data (FBSRD)

PUBLICATION-DATE: September 29, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Mani-Meitav, Irit	Atlit		IL
Sarfati, Assaf	Tiv'on		IL

US-CL-CURRENT: 714/6

`Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De`

☐ 3. Document ID: US 20050216695 A1

L6: Entry 3 of 16   File: PGPB   Sep 29, 2005

PGPUB-DOCUMENT-NUMBER: 20050216695
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050216695 A1

TITLE: Memory extension for a data processor to provide both common and separate physical memory areas for virtual memory spaces

PUBLICATION-DATE: September 29, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Bono, Jean-Pierre	Westboro	MA	US

US-CL-CURRENT: 711/203; 711/207, 711/209

`Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De`

☐ 4. Document ID: US 20050193245 A1

L6: Entry 4 of 16   File: PGPB   Sep 1, 2005

PGPUB-DOCUMENT-NUMBER: 20050193245
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050193245 A1

TITLE: Internet protocol based disaster recovery of a server

PUBLICATION-DATE: September 1, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Hayden, John M.	Holliston	MA	US
Wang, Hongmei	Shrewsbury	MA	US
Corniquet, Frederic	Le Pecq	MA	FR
Armangau, Philippe	Acton	MA	US
Donette, Pascal	Magny les Hameaux		FR
John, Aju	Northborough		US

US-CL-CURRENT: 714/13

`Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De`

☐ 5.   Document ID: US 20050065985 A1

L6: Entry 5 of 16   File: PGPB   Mar 24, 2005

PGPUB-DOCUMENT-NUMBER: 20050065985
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050065985 A1

TITLE: Organization of read-write snapshot copies in a data storage system

PUBLICATION-DATE: March 24, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Tummala, Himabindu	South Grafton	MA	US
Armangau, Philippe	Acton	MA	US

US-CL-CURRENT: 707/201

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D |

☐ 6.   Document ID: US 20050015663 A1

L6: Entry 6 of 16   File: PGPB   Jan 20, 2005

PGPUB-DOCUMENT-NUMBER: 20050015663
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050015663 A1

TITLE: Data recovery with internet protocol replication with or without full resync

PUBLICATION-DATE: January 20, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Armangau, Philippe	Acton	MA	US
Bergant, Milena	North Grafton	MA	US
Srinivasan, Karthikeyan	Framingham	MA	US

US-CL-CURRENT: 714/15

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D |

☐ 7.   Document ID: US 20040267836 A1

L6: Entry 7 of 16   File: PGPB   Dec 30, 2004

PGPUB-DOCUMENT-NUMBER: 20040267836
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040267836 A1

TITLE: Replication of snapshot using a <u>file system</u> copy differential

PUBLICATION-DATE: December 30, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Armangau, Philippe	Acton	MA	US
Bergant, Milena	North Grafton	MA	US

US-CL-CURRENT: <u>707/203</u>

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D |

☐ 8.   Document ID: US 20040107222 A1

L6: Entry 8 of 16   File: PGPB   Jun 3, 2004

PGPUB-DOCUMENT-NUMBER: 20040107222
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040107222 A1

TITLE: Client-server protocol for directory access of snapshot <u>file systems</u> in a storage system

PUBLICATION-DATE: June 3, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Venkatesh, Dinesh	Westford	MA	US
Jiang, Xiaoye	Shrewsbury	MA	US
Zheng, Jiannan	Ashland	MA	US
Vahalia, Uresh	Newton	MA	US

US-CL-CURRENT: <u>707/200</u>

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D |

☐ 9.   Document ID: US 20040030951 A1

L6: Entry 9 of 16   File: PGPB   Feb 12, 2004

PGPUB-DOCUMENT-NUMBER: 20040030951
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040030951 A1

TITLE: Instantaneous restoration of a production <u>copy from a snapshot copy</u> in a data storage system

PUBLICATION-DATE: February 12, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Armangau, Philippe	Acton	MA	US

US-CL-CURRENT: <u>714</u>/<u>6</u>

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De |

☐ 10. Document ID: US 20040030846 A1

L6: Entry 10 of 16   File: PGPB   Feb 12, 2004

PGPUB-DOCUMENT-NUMBER: 20040030846
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040030846 A1

TITLE: Data storage system having meta bit maps for indicating whether data blocks are invalid in <u>snapshot copies</u>

PUBLICATION-DATE: February 12, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Armangau, Philippe	Acton	MA	US
Tummala, Himabindu	South Grafton	MA	US

US-CL-CURRENT: <u>711</u>/<u>154</u>; <u>711</u>/<u>159</u>

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De |

☐ 11. Document ID: US 20040030727 A1

L6: Entry 11 of 16   File: PGPB   Feb 12, 2004

PGPUB-DOCUMENT-NUMBER: 20040030727
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040030727 A1

TITLE: Organization of multiple <u>snapshot copies</u> in a data storage system

PUBLICATION-DATE: February 12, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Armangau, Philippe	Acton	MA	US
Bergant, Milena	North Grafton	MA	US
Wang, Hongmei	Shrewsbury	MA	US
Potnis, Ajay	Sauth Grafton	MA	US
Angelone, Raymond A.	Norfolk	MA	US

US-CL-CURRENT: <u>707</u>/<u>200</u>

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D |

☐ 12.　Document ID: US 20030182253 A1

L6: Entry 12 of 16　　　　　　　　File: PGPB　　　　　Sep 25, 2003

PGPUB-DOCUMENT-NUMBER: 20030182253
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030182253 A1

TITLE: System and method for restoring a single file from a snapshot

PUBLICATION-DATE: September 25, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Chen, Raymond C.	Campbell	CA	US
Patel, Kayuri	Cupertino	CA	US
Kahn, Andy C.	San Francisco	CA	US
Edwards, John K.	Sunnyvale	CA	US

US-CL-CURRENT: <u>707</u>/<u>1</u>

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D |

☐ 13.　Document ID: US 6957362 B2

L6: Entry 13 of 16　　　　　　　　File: USPT　　　　　Oct 18, 2005

US-PAT-NO: 6957362
DOCUMENT-IDENTIFIER: US 6957362 B2

TITLE: Instantaneous restoration of a production <u>copy from a snapshot copy</u> in a data storage system

DATE-ISSUED: October 18, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Armangau; Philippe	Acton	MA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
EMC Corporation	Hopkinton	MA			02

APPL-NO: 10/213335　[PALM]
DATE FILED: August 6, 2002

INT-CL: [07] G06 F 11/00

US-CL-ISSUED: 714/20; 714/15
US-CL-CURRENT: 714/20; 714/15

FIELD-OF-SEARCH: 714/15, 714/16, 714/19, 714/20

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4608688	August 1986	Hansen et al.	371/11
4686620	August 1987	Ng	364/200
4755928	July 1988	Johnson et al.	364/200
4815028	March 1989	Saitoh	714/20
5060185	October 1991	Naito et al.	364/900
5089958	February 1992	Horton et al.	714/5
5206939	April 1993	Yanai et al.	395/400
5357509	October 1994	Ohizumi	714/7
5381539	January 1995	Yanai et al.	395/425
5535381	July 1996	Kopper	395/600
5596706	January 1997	Shimazaki et al.	395/182.04
5673382	September 1997	Cannon et al.	395/182.04
5737747	April 1998	Vishlitzky et al.	711/118
5742792	April 1998	Yanai et al.	395/489
5819292	October 1998	Hitz et al.	707/203
5829046	October 1998	Tzelnic et al.	711/162
5829047	October 1998	Jacks et al.	711/162
5835953	November 1998	Ohran	711/162
5835954	November 1998	Duyanovich et al.	711/162
5915264	June 1999	White et al.	711/168
5923878	July 1999	Marsland	395/704
5974563	October 1999	Beeler, Jr.	714/5
6016553	January 2000	Schneider et al.	714/21
6061770	May 2000	Franklin	711/162
6076148	June 2000	Kedem	711/162
6078929	June 2000	Rao	707/200
6269431	July 2001	Dunham	711/162
6279011	August 2001	Muhlestein	707/204
6434681	August 2002	Armangau	711/162
6549992	April 2003	Armangau et al.	711/162
6594781	July 2003	Komasaka et al.	714/19
6618794	September 2003	Sicola et al.	711/154
2003/0079102	April 2003	Lubbers et al.	711/202
2003/0158873	August 2003	Sawdon et al.	707/204
2003/0188101	October 2003	Fore et al.	711/114
2004/0030727	February 2004	Armangau et al.	714/6

2004/0030846   February 2004   Armangau et al.   711/154

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D.L. Burkes and R.K. Treiber, "Design Approaches for Real-Time Transaction Processing Remote Site Recovery," in Spring COMPCON90, Feb. 26-Mar. 2, 1990, Thirty-Fifth IEEE Computer Society International Conference, San Francisco, CA, pp. 568-572.
"VERITAS NetBackup and Storage Migrator" http://www.sun.com/stora.../netbackup.html; $sessionid$QEOQTDQAAC2QHAMTA1FU5Y, published at least as early as Oct. 28, 2000, 5 pages.
R. Stager and D. Hitz, Internet Draft, filename "draft-stager-iquard-netapp-backup-0.5.txt" Network Data Management Protocol (NDMP), last update Oct. 12, 1999, pp. 1-73.
"Network Data Management Protocol (NDMP)," http://www.ndmp.org/info/; NDMP White Paper, http://www.ndmp.org/info/technology/wp.html; "Protocol Specification Summary, Document Version: 1.7.2S," http://www.ndmp.org/info/spec_summary.html; "Legato Systems Embraces the NDMP Compliant in Q3," http://www-ftp.legata.com/News/Press/PR209.html; published at least as early as Oct. 11, 1999, 17 pages.
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Koop, P., "Replication at Work. (four companies use Oracle and Sybase replication servers to solve business problems)," DBMS, vol. 8, No. 3, p. 54(4), Mar. 1995.
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EMC TimeFinder Product Description Guide, EMC Corporation, Hopkinton, MA, 1998, pp. 1-31.
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Using EMC CLARiiON FC4700 and SnapView with Oracle 8i, Engineering White Paper, EMC Corporation, Hopkinton, MA, Mar. 4, 2002, pp. 1-22.
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VERITAS Volume Replication and Oracle Databases, A Solutions White Paper, Veritas Software Corporation, Mountain View, CA, May 29, 2000, pp. 1-31.
Nabil Osorio and Bill Lee, Guidelines for Using Snapshot Storage Systems for Oracle

Databases, Oracle Corporation, Oct. 2001, pp. 12.

ART-UNIT: 2114

PRIMARY-EXAMINER: Beausoliel; Robert

ASSISTANT-EXAMINER: Chu; Gabriel L.

ATTY-AGENT-FIRM: Auchterlonie; Richard C. Novak Druce & Quigg, LLP

ABSTRACT:

A data storage system maintains a production dataset supported by a clone volume,
and multiple snapshot datasets supported by respective save volumes in a snapshot
queue. In order to instantaneously restore the production dataset with the state of
any specified snapshot, the data storage system responds to requests for read/write
access to the production dataset by reading from the specified snapshot dataset and
writing to the production dataset. The data storage system keeps a record of data
blocks that have been modified by writing to the production dataset. The data
storage system initiates a process of copying data blocks from the specified
snapshot dataset to the production dataset if the record of the data blocks
indicates that the data blocks have not yet been modified by writing to the
production dataset.

31 Claims, 40 Drawing figures

| Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw De |

☐ 14. Document ID: US 6934822 B2

L6: Entry 14 of 16   File: USPT   Aug 23, 2005

US-PAT-NO: 6934822
DOCUMENT-IDENTIFIER: US 6934822 B2

TITLE: Organization of multiple snapshot copies in a data storage system

DATE-ISSUED: August 23, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Armangau; Philippe	Acton	MA		
Bergant; Milena	North Grafton	MA		
Wang; Hongmei	Shrewsbury	MA		
Potnis; Ajay S.	South Grafton	MA		
Angelone; Raymond A.	Norfolk	MA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
EMC Corporation					02

APPL-NO: 10/213242   [PALM]
DATE FILED: August 6, 2002

INT-CL: [07] G08 F 12/00

US-CL-ISSUED: 711/162; 707/10, 707/201, 714/6, 714/15, 714/20
US-CL-CURRENT: 711/162; 707/10, 707/201, 714/15, 714/20, 714/6

FIELD-OF-SEARCH: 707/10, 707/201-205, 709/104, 711/161, 711/162, 711/156, 711/165,
714/6, 714/15, 714/20

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4608688	August 1986	Hansen et al.	371/11
4686620	August 1987	Ng	364/200
4755928	July 1988	Johnson et al.	364/200
5060185	October 1991	Naito et al.	364/900
5206939	April 1993	Yanai et al.	
5381539	January 1995	Yanai et al.	
5535381	July 1996	Kopper	
5596706	January 1997	Shimazaki et al.	395/182.04
5673382	September 1997	Cannon et al.	
5737747	April 1998	Vishlitzky et al.	711/118
5742792	April 1998	Yanai et al.	
5819292	October 1998	Hitz et al.	707/203
5829046	October 1998	Tzelnic et al.	711/162
5829047	October 1998	Jacks et al.	711/162
5835954	November 1998	Duyanovich et al.	711/162
5915264	June 1999	White et al.	711/168
5923878	July 1999	Marsland	395/704
5974563	October 1999	Beeler, Jr.	714/5
6061770	May 2000	Franklin	711/162
6076148	June 2000	Kedem	711/162
6078929	June 2000	Rao	707/200
6269431	July 2001	Dunham	711/162
6279011	August 2001	Muhlestein	707/204
6434681	August 2002	Armangau	711/162
6549992	April 2003	Armangau et al.	711/162
6618794	September 2003	Sicola et al.	711/154
6732124	May 2004	Koseki et al.	707/202
2001/0044910	November 2001	Ricart et al.	714/6
2003/0079102	April 2003	Lubbers et al.	711/202
2003/0158873	August 2003	Sawdon et al.	707/204
2004/0030846	February 2004	Armangau et al.	711/154
2004/0030951	February 2004	Armangau	714/6

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EMC TimeFinder Product Description Guide, EMC Corporation, Hopkinton, MA, 1998, pp. 1-31.

Leveraging SnapView/IP in Oracle8i Environments with the CLARiiON IP4700 File Server, Engineering White Paper, EMC Corporation, Hopkinton, MA, Feb. 13, 2002, pp. 1-16.

Using EMC CLARiiON FC4700 and SnapView with Oracle 8i, Engineering White Paper, EMC Corporation, Hopkinton, MA, Mar. 4, 2002, pp. 1-22.

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VERITAS Volume Replication and Oracle Databases, A Solutions White Paper, Veritas Software Corporation, Mountain View, CA, May 29, 2000, pp. 1-31.

Nabil Osorio and Bill Lee, Guidelines for Using Snapshot Storage Systems for Oracle Databases, Oracle Corporation, Oct. 2001, pp. 12.

"RFC 1094--NFS: Network File System Protocol Specification," Network Working Group, Request for Comments: 1094, Sun Microsystems, Inc., Mar. 1989, pp. 1-27, http://rfc.sunsite.dk/rfc/rfc1094.html.

Uresh Vahalia, Unix Internals--The New Frontiers, Prentice-Hall Inc., New Jersey, 1996, Chapter 9, File System Implementations, pp. 261-289.

Brian W. Kerninghan and Rob Pike, The UNIX Programming Environment, Prentice-Hall Inc., New Jersey, 1984, Chapter 2, The File System, pp. 41-70.

Mendel Rosenblum and John K. Ousterhout, "The Design and Implementation of a Log-Structured File System," ACM Transactions on Computer Systems, vol. 10, No. 1, Feb. 1992, pp. 26-52.

Fred Douglis and John Ousterhout, "Log-Structured File Systems," in Spring COMPCON89, Feb. 27-Mar. 31, 1989, Thirty-Fourth IEEE Computer Society International Conference, San Francisco, CA, pp. 124-129.

David A. Patterson, Peter Chen, Garth Gibson, and Randy H. Katz, "Introduction to Redundant Arrays of Inexpensive Disks (RAID)," in Spring COMPCON89, Feb. 27-Mar. 31, 1989, Thirty-Fourth IEEE Computer Society International Conference, San Francisco, CA, pp. 112-117.

D.L Burkes and R.K. Treiber, "Design Approaches for Real-Time Transaction Processing Remote Site Recovery," in Spring COMPCON90, Feb. 26-Mar. 2, 1990, Thirty-Fifth IEEE Computer Society International Conference, San Francisco, CA, pp. 568-572.

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R. Stager and D. Hitz, Internet Draft, filename "draft-stager-iquard-netapp-backup-0.5.txt" Network Data Management Protocol (NDMP), last update Oct. 12, 1999, pp. 1-73.

"Network Data Management Protocol (NDMP)," http://www.ndmp.org/info/; NDMP White Paper, http://www.ndmp.org/info/technology/wp.html; "Protocol Specification Summary, Document Version: 1.7.2S," http://www.ndmp.org/info/spec_summary.html; "Legato Systems Embraces the NDMP Standard: Legato Networker Software to be NDMP Compliant in Q3," http://www-ftp.legata.com/News/Press/PR209.html; published at

least as early as Oct. 11, 1999, 17 pages.

ART-UNIT: 2187

PRIMARY-EXAMINER: Chace; Christian P.

ATTY-AGENT-FIRM: Auchterlonie; Richard C. Novak Druce & Quigg, LLP.

ABSTRACT:

A file server maintains a production file system supported by a clone volume, and multiple snapshot file systems supported by respective save volumes in a snapshot queue. Before a data block is modified for the first time after creation of the youngest snapshot, the data block is copied from the clone volume to the save volume of the youngest snapshot. A bit map indicates the blocks that have already been copied, and a block map shows the save block address for each corresponding clone block address. When a new snapshot is created, the bit and block maps are converted to a hash index that is kept linked to the save volume of what had been the youngest snapshot. When other than the oldest snapshot file system is deleted, the respective save volume is retained as a hidden object until it becomes the oldest save volume.

54 Claims, 40 Drawing figures

| Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw D |

☐ 15. Document ID: US 6792518 B2

L6: Entry 15 of 16   File: USPT   Sep 14, 2004

US-PAT-NO: 6792518
DOCUMENT-IDENTIFIER: US 6792518 B2

TITLE: Data storage system having mata bit maps for indicating whether data blocks are invalid in snapshot copies

DATE-ISSUED: September 14, 2004

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FIELD-OF-SEARCH: 707/203, 707/204, 711/112, 711/156, 711/161, 711/162, 714/5

PRIOR-ART-DISCLOSED:

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PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
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ART-UNIT: 2187

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ATTY-AGENT-FIRM: Novak Druce LLP Auchterlonie; Richard C.

ABSTRACT:

In a data storage system providing access to a production dataset and snapshot

copies of the production dataset, a production meta bit map identifies blocks of storage that are invalid in the production dataset. If a block in the production dataset is invalid when a snapshot copy is being made, then there is no need to copy the block to storage for the snapshot before writing to the block. Moreover, if a block in the production dataset supporting a snapshot copy is dynamically invalidated, it may be kept in the production dataset until it is written to. For this purpose, a respective snapshot copy of the meta bit map is made and kept with each of the snapshot datasets, and the snapshot copies of the meta bit map are merged in order to indicate the blocks that are invalid for all of the snapshots.

46 Claims, 40 Drawing figures

| Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw De |

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TITLE: File server operation method in data network, involves checking whether save volume block is allocated to specified block of read-write snapshot copy of production file system, and reading data from allocated save block

INVENTOR: ARMANGAU, P; TUMMALA, H

PRIORITY-DATA: 2003US-0668783 (September 23, 2003)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 20050065985 A1	March 24, 2005		024	G06F012/00

INT-CL (IPC): G06 F 12/00

ABSTRACTED-PUB-NO: US20050065985A
BASIC-ABSTRACT:

NOVELTY - The save volume blocks are allocated to a specified block of a read-write snapshot copy of a production file system, while writing new data to read-write snapshot copy. The allocation of save volume block to specified block of read-write snapshot copy, is checked while reading read-write snapshot copy. When save block is allocated, data from allocated block is read, else related read-only snapshot copy of file system is read.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for file server.

USE - For operating file server (claimed) used for creating and maintaining rear-write snapshot copy of production file system in data network.

ADVANTAGE - The series of read-only snapshots of the production file system are maintained in the file server efficiently. The backup processing time and the backup storage capacity of the file server are reduced reliably. The production

file can be restored with specified read-write snapshot copy easily.

DESCRIPTION OF DRAWING(S) - The figure shows a block diagram of the data network.

| Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw Dr |

| Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS |

Term	Documents
ALLOCAT$	0
ALLOCAT	120
ALLOCATABILITY	10
ALLOCATABLE	1454
ALLOCATABLEBYTES	1
ALLOCATABLEE	1
ALLOCATABLEPERSISTENTBYTES	1
ALLOCATABLE-ADDRESSABLE	1
ALLOCATABLE-AREA	1
ALLOCATABLE-OPT	1
(L5 AND ALLOCAT$).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	16

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